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Abstract

An exposure apparatus (EA2) that uses X-ray radiation in a photolithographic process and can obtain various measurements regarding the X-ray radiation used, by obtaining and analyzing readings of the photoelectric effect on various reflective surfaces (5, 60a, 60b, 7, 7a, 9a, 9b, 9c and 9d) or optical elements (50a and 51). With the measurements of the X-ray radiation, the exposure apparatus can control the exposure dose during the mask (8) and wafer (10) illumination process. The exposure system also has the ability to detect deformation in the mirrors (9a, 9b, 9c and 9d) of the projection optical system caused by heat generated by absorption of the X-ray radiation. This is accomplished by analyzing the photoelectric effect occurring on the mirror surfaces and correcting the deformation of the mirrors based on this analysis.

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